Title The Changing Counterfactual and Its Impact on Replication
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Background. Experimental and quasi-experimental designs are often used in educational research to establish causality and identify effective practices. These research designs rely on a counterfactual model, which, in simplest form, calls for a comparison between a treatment group and control group from whom (by definition) the treatment is withheld. However, we believe developers of educational practices too often assume that the population from which control groups are drawn is static and unchanging in its behavior or performance. This is not always the case. Populations, and study samples, can change over time—sometimes dramatically so. The changing nature of the counterfactual directly impacts the ability of researchers to replicate previously demonstrated effects.

Purpose. We illustrate the impact of a changing counterfactual by presenting data from five randomized control trials (RCTs) of the efficacy of Kindergarten Peer-Assisted Learning Strategies (K-PALS) conducted across nine years (i.e., 1996-2005). The purpose of this talk is to discuss the impact of changing comparison conditions on evaluations of the effects of an intervention.

Setting. The five RCTs were conducted in elementary schools within a large metropolitan area in the southern United States. Interventions took place in the general education Kindergarten classroom.

Population. The studies involved 2,591 Kindergarten students and their teachers. The sample included students who were Black (42.2%), White (40.3%), and of another race (17.4%). Additionally, 54.4% of students qualified for Title I, 11.9% were English Language Learners, and 6.3% qualified for Special Education services.

Intervention. K-PALS is a supplemental early reading program designed to intensify students’ practice of important early reading skills (e.g., phonological awareness, letter-sound recognition, decoding; Fuchs, Fuchs, Thompson, Al Otaiba, et al., 2001; Fuchs, Fuchs, Thompson, Svenson, et al., 2001) Intervention was delivered in 30-minute sessions three times per week for 16 weeks. The intervention involved a brief (i.e., 5-10 minute) teacher-directed component in which students practiced phonological awareness skills and were introduced to new letter sounds and words. This was followed by a longer (i.e., 10-20 minute) component in which students practiced decoding and word recognition skills with a partner.

Research Design. For each of the five RCTs, classroom teachers were randomly assigned to treatment or control conditions. Treatment teachers were trained to deliver the intervention and were provided ongoing coaching support by project staff to improve fidelity of implementation.
**Data Collection and Analysis.** For each of the five RCTs, student outcomes in treatment and control classrooms were assessed just before treatment and 16 weeks later, immediately following treatment completion. Analyses were conducted to evaluate the relative benefit of K-PALS on early reading outcomes.

To evaluate the influence of a changing counterfactual, we conducted two sets of analyses. First, we examined each year’s data independently (i.e., analyzing data separately for each of the five RCTs). Our aim was to ensure consistency of analyses to facilitate year-by-year comparisons. Second, we conducted an across-years analysis (i.e., analyzing a combined data set from all five years) so we could more directly explore the possibility of an interaction between time and intervention effects. Before discussing these analyses, we briefly describe our measures.

**Findings.** The purpose of these analyses was to explore whether the efficacy of K-PALS diminished as a function of time. Results from the first set of year-by-year analyses indicated that, although K-PALS students in 2004 and 2005 made substantial gains in early reading skills, the benefit of the treatment in comparison to controls weakened due to the improved performance of the controls. Findings from our across-years analyses further substantiate the conclusion that the superiority of K-PALS diminished over time on two of four measures.

**Conclusions.** Replication takes place within an ever-changing context and time has the potential to dramatically change counterfactual conditions. We will discuss the impact of a changing counterfactual on both the researcher’s role in conducting intervention research and the use of replication to establish evidence-based practices.

**References**
